CITY OF AKUTAN

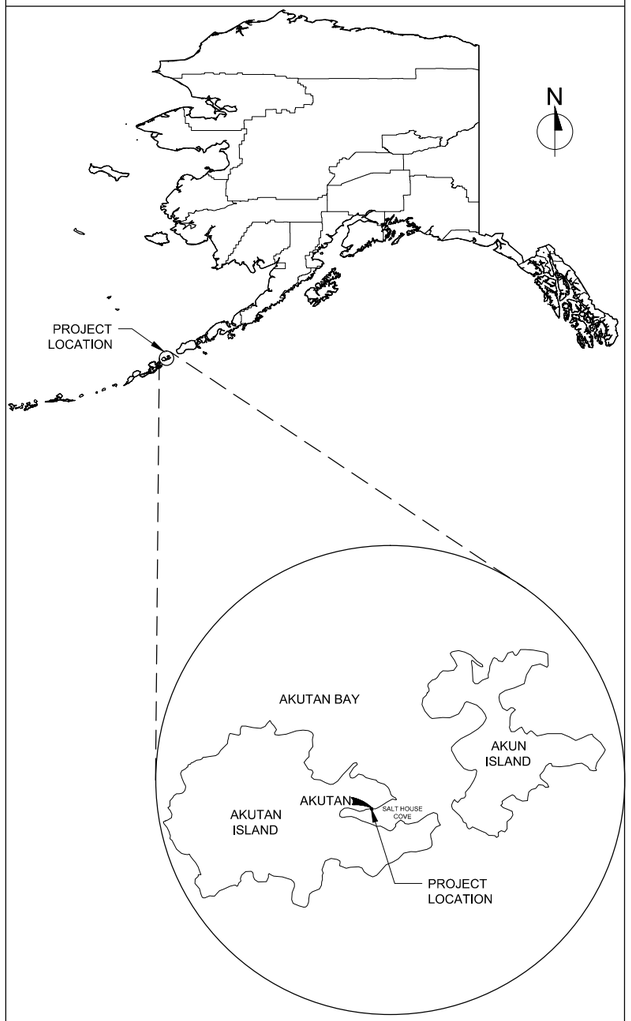
AKUTAN CITY DOCK IMPROVEMENTS

ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

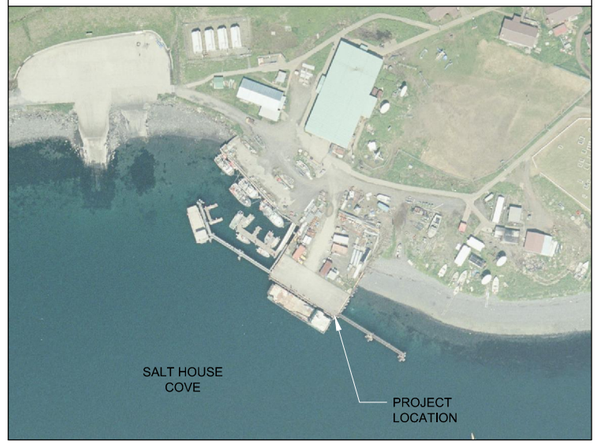
STRUCTURE NO. 1946

AKUTAN, ALASKA

VICINITY MAP



LOCATION MAP



SHEET INDEX

REFERENCE DRAWING LIST:

(THE FOLLOWING WERE REVIEWED IN PREPARATION OF THESE DOCUMENTS)
OTT ENGINEERING, INC., AKUTAN PUBLIC DOCK, MARCH 1990
TRYCK NYMAN HAYES INC. (RECENTLY ACQUIRED BY URS), BREAKWATER EXPANSION, NOVEMBER 2003
CITY OF AKUTAN, CITY DOCK MOORAGE EXPANSION, APRIL 2004

CONTACTS

OWNER

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DESIGN ENGINEER

MEAD & HUNT, INC.
PHONE: 916-971-3961 / FAX: 916-971-0578
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CONTACT: NATHAN ROCKWOOD, PROJECT MANAGER

REVIEW AGENCY

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PRELIMINARY

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REVISION
100% PLANS

NOT FOR CONSTRUCTION

AIP:	---
M&H NO.:	30543-00-10001
DATE:	6/14/13
DESIGNED BY:	SAL
DRAWN BY:	JTH/APF
CHECKED BY:	JJB/NDR

DO NOT SCALE DRAWINGS

SHEET CONTENTS
COVER SHEET

SHEET NO. 1 of 13

G-001

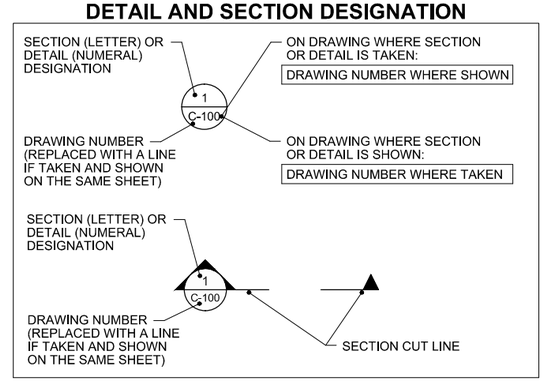
ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALTIC CONCRETE
ADJ	ADJUSTABLE
A/E	ARCHITECT/ENGINEER
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
ALT	ALTERNATE
APP	APPROXIMATE
BF	BACK FACE
BM	BENCHMARK
BO	BOTTOM OF _____
BOC	BOTTOM OF CONCRETE
BOW	BOTTOM OF WALL
BTU	BRITISH THERMAL UNIT
BTUH	BTU'S PER HOUR
℄	CENTER LINE
CA	COMPRESSED AIR
C	CURVE, CONDUIT
C-C	CENTER TO CENTER
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CJ	CONSTRUCTION JOINT
CJP	COMPLETE JOINT PENETRATION
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CP	CONTROL POINT, CIRCULATION PUMP
DEG OR °	DEGREE
DEMO	DEMOLITION
DIA OR Ø	DIAMETER
DOT	DEPARTMENT OF TRANSPORTATION
D/S	DOWNSTREAM
DWG	DRAWING
E	EAST
EA	EACH
EF	EACH FACE, EXHAUST FAN
EG	EXISTING GRADE/GROUND
EL	ELEVATION, EMERGENCY LIGHT
EMT	ELECTRICAL METALLIC TUBING
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EW	EACH WAY, EDGE OF WATER
E-W	EAST-WEST
EXC	EXCAVATION
EX	EXISTING
FF	FINISH FLOOR
FG	FINISHED GRADE
FL	FLOW LINE
FPS	FOOT PER SECOND
FT	FOOT OR FEET
FTG	FOOTING
GALV	GALVANIZED
HDPE	HIGH DENSITY POLYTHENE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HT	HEIGHT
HW	HEADWATER
HWL	HIGH WATER LEVEL
HYD	HYDRAULIC
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IF	INSIDE FACE
IN	INCH, INCHES
INV	INVERT
JT	JOINT
K	RATE OF VERTICAL CURVATURE
KW	KILOWATT
L	LENGTH
LAT	LATITUDE
LB(S)	POUND(S)
LD	DEVELOPMENT LENGTH
LF	LINEAR FEET
LWL	LOW WATER LEVEL
MAINT	MAINTENANCE
MAX	MAXIMUM
MBH	THOUSANDS OF BTU'S PER HOUR
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NIC	NOT IN CONTRACT
NO	NUMBER
N-S	NORTH-SOUTH
NTS	NOT TO SCALE
NHW	NORMAL HEADWATER
OC	ON CENTER
OD	OUTSIDE DIAMETER
OED	OPEN END DUCT
OF	OUTSIDE FACE
O-O	OUTSIDE TO OUTSIDE
OPP	OPPOSITE
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
℄	PLATE
PC	POINT OF CURVATURE
PCF	POUNDS PER CUBIC FOOT
PERM	PERMANENT
PERP	PERPENDICULAR
PI	POINT OF INTERSECTION
POB	POINT OF BEGINNING
PP	POWER POLE
PREFAB	PREFABRICATED
PRES	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE, POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
QCIP	QUALITY CONTROL INSPECTION PROGRAM
QTY	QUANTITY
R	RADIUS
RD	ROAD
RECT	RECTANGULAR
REF	REFERENCE
REQD	REQUIRED
RET	RETAINING
S	SOUTH
SCH	SCHEDULE
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SP	SUMP PUMP
SPEC	SPECIFICATION
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STR	STRUCTURE
SYM	SYMBOL
TBR	TO BE REMOVED
TEMP	TEMPORARY
TO	TOP OF _____
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TOPO	TOPOGRAPHY
TRANS	TRANSITION
TSL	TOP OF SLAB
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
U/S	UPSTREAM
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
UTIL	UTILITY
V	VELOCITY
VC	VERTICAL CURVE LENGTH
VERT	VERTICAL
W	WEST
W/	WITH
W/O	WITHOUT
WD	WIDTH
WP	WORKING POINT, WATER PROOF
WS-E	WATERSTOP-EMBEDDED
WS-H	WATERSTOP-HYDROPHILIC
WT	WEIGHT
WWF	WELDED WIRE FABRIC/REINFORCEMENT
WY	WAY

LEGEND

CENTERLINE — 25+00
COMMUNICATION UTILITY LINE — COM
ELECTRIC UTILITY LINE — E
STORM DRAIN LINE — SD
CONTOUR LINE - MINOR — 1775
CONTOUR LINE - MAJOR — 1770
FENCING — X
WATER SURFACE ELEVATION
GUARDRAIL
STREET LIGHT
FLOW DIRECTION
TREE
GATE
SIGN
UTILITY POLE
CATCH BASIN
ALUMINUM ANODE

DETAIL AND SECTION DESIGNATION



GENERAL

G-1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THESE DRAWINGS.

G-2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING RECORD DRAWINGS FOR ALL WORK THROUGHOUT THE COURSE OF CONSTRUCTION. SUCH DRAWINGS SHALL RECORD THE LOCATION AND AS-BUILT CONDITION OF ALL PROJECT ELEMENTS. COPIES SHALL BE DELIVERED TO THE OWNER PRIOR TO THE ACCEPTANCE OF THE WORK AS INDICATED IN THE SPECIFICATIONS.

G-3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE JOB AND CONTRACT DRAWINGS. THE CONTRACTOR SHALL RESOLVE ANY CONFLICTS WITH THE OWNER PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH CONSTRUCTION. DETAILS AND DIMENSIONS OF EXISTING CONDITIONS AS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL SUCH DETAILS AND DIMENSIONS AND RESOLVE CONFLICTS.

G-4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND SUBCONTRACTORS UNDER THE CONTRACTOR'S JURISDICTION.

G-5. THE CONTRACTOR SHALL EXAMINE THE DOCUMENTS AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES WHICH MAY BE FOUND PRIOR TO THE START OF WORK.

G-6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, SIZES AND LOCATIONS OF ALL EXISTING FACILITIES, UNDERGROUND UTILITIES, AND FEATURES TO REMAIN BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

G-7. DIMENSIONS CONTROLLED BY EXISTING STRUCTURES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND/OR FABRICATION. ALL ELEVATIONS AND DIMENSIONS OF EXISTING AND NEW STRUCTURES SHOWN ON THE DRAWINGS ARE BASED ON A LIMITED SURVEY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS REGARDLESS OF DIMENSIONS AND ELEVATIONS SHOWN.

G-8. TOPOGRAPHIC SURVEY, GEOTECHNICAL SURVEY, AND SURVEY CONTROL INFORMATION ARE PROVIDED FOR THE PURPOSE OF INFORMATION ONLY. THE ENGINEER AND THE OWNER SHALL NOT BE HELD LIABLE FOR THE ACCURACY OF THE PROVIDED INFORMATION.

G-9. THE CONTRACTOR SHALL CONDUCT OPERATIONS OUTSIDE OF AREAS TO BE PRESERVED OR PROTECTED ACCORDING TO THE PLANS.

G-10. EXISTING GRADES AND CONDITIONS SHALL BE CONFORMED TO WHENEVER POSSIBLE. ANY ADJACENT OR OFF SITE AREAS DISTURBED BY THE CONTRACTOR'S OPERATION MUST BE RESTORED BY THE CONTRACTOR TO THE PRE DISTURBANCE CONDITION TO THE SATISFACTION OF THE OWNER.

G-11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING FACILITIES.

G-12. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MONUMENTS AND OTHER SURVEY MARKERS. MONUMENTS AND SURVEY MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED BY A LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL PROVIDE AGENCY SURVEYORS WITH AT LEAST 48 HOURS ADVANCE NOTICE PRIOR TO REPLACEMENT.

G-13. THE HORIZONTAL AND VERTICAL DATUM USED WAS TAKEN FROM DESIGN DOCUMENTS "REFERENCE DRAWING LIST" ON SHEET G-001 FOR THE AKUTAN PUBLIC DOCK.

HORIZONTAL CONTROL: SHALL BE ESTABLISHED AND MAINTAINED BY THE CONTRACTOR USING THE EXISTING MAIN DOCK ALIGNMENT AND POSITION OF EXISTING BOLLARDS.

VERTICAL CONTROL: SHALL BE ESTABLISHED BY THE CONTRACTOR BASED ON LOCAL NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION TITLE BENCHMARKS. PROJECT SURVEYS SHALL BE CONDUCTED IN ACCORDANCE WITH SPECIFICATIONS.

G-14. DO NOT SCALE DRAWINGS.

G-15. ALL MATERIALS SHALL BE STORED IN A DRY ENVIRONMENT UNLESS OTHERWISE APPROVED BY THE OWNER AND ENGINEER.

G-16. THE CONTRACTOR SHALL ESTABLISH THE REFERENCE LINE AND ANY OFFSETS REQUIRED UTILIZING EXISTING MONUMENTS.

G-17. DETAILS MARKED "TYPICAL" SHALL APPLY IN ALL CASES, UNLESS NOTED OTHERWISE. FOR CONDITIONS DEVIATING FROM THE TYPICAL AND NOT SPECIFICALLY DETAILED IN THE PLANS, THE CONTRACTOR SHALL VERIFY CONSTRUCTION DETAILS WITH THE OWNER.

G-18. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING AND MAINTAINING ALL WARNING SIGNS, DEVICES, AND FEATURES NECESSARY TO PROTECT THE HEALTH AND SAFETY OF THE GENERAL PUBLIC AND WORKERS AND TO PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK.

G-19. THE LOCATION OF EXISTING UTILITIES IN CONSTRUCTION AREAS SHALL BE FIELD VERIFIED BY THE CONTRACTOR. EXISTING UTILITIES TO REMAIN SHALL BE PROTECTED. ANY REPAIR OR RELOCATION REQUIRED, AS A RESULT OF DAMAGE BY CONSTRUCTION ACTIVITIES SHALL BE AT THE CONTRACTOR'S EXPENSE.

G-20. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY BRACING, SHORING AND SUPPORT NECESSARY TO ACHIEVE THE FINISHED STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND ENFORCING ALL CONSTRUCTION LOAD LIMITS ON THE STRUCTURE.

G-21. SHORING AND BRACING SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SAFETY AND STRUCTURAL INTEGRITY IS NOT COMPROMISED DURING THE ENTIRE PROCESS. SAFETY ISSUES SHALL BE IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES. REQUIREMENTS OF THE USACE SAFETY AND HEALTH MANUAL, EM 385-1-1 SHALL BE ADHERED TO.

G-22. DRAWINGS USED TO PREPARE THESE DESIGN DOCUMENTS ARE REFERENCED ON SHEET G-001. TOP OF DOCK ELEVATION REFERENCED IN THOSE DRAWINGS IS INDICATED AS +9.0'. HOWEVER, UPON FURTHER INVESTIGATION, THE ELEVATION OF TOP OF EXISTING MAIN DOCK (SHOWN ON SHEET S-102) IS APPROXIMATELY +11.2'.

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M&H NO.: 30543-00-10001
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DRAWN BY: JTH/APF
CHECKED BY: JJB/NDR
DO NOT SCALE DRAWINGS

SHEET CONTENTS
GENERAL NOTES AND ABBREVIATIONS

SHEET NO. 2 of 13

G-002

SALT HOUSE COVE

M/V TUSTUMENA

-47'-11"

EXISTING BREASTING DOLPHIN E-1

EXISTING BREASTING DOLPHIN E-2

EXISTING WALKWAY

NEW WALKWAY

NEW MOORING DOLPHIN PILES

EXISTING MOORING DOLPHIN W-1

EXISTING MOORING DOLPHIN W-2

EXIST WALKWAY

EXIST WALKWAY & SHEET PILE WALL

EXIST SHEET PILE WALL

EXIST FLOAT WALKWAY

EXIST MAIN DOCK

EAST DOLPHINS SEE S-101

MAIN DOCK SEE S-102

WEST DOLPHINS SEE S-103

MATCH LINE

MATCH LINE

EXIST GANGWAY

EXIST SHEET PILE WALL

EXIST STL SHEETPILE BULKHEAD

EXIST CONC BARGE

EXIST AKUTAN ROADHOUSE

EXIST U/G FUEL STORAGE

EXIST GARAGE

EXISTING GENERATOR BLDG

EXISTING WAREHOUSE

EXISTING BOARDWALK

EXISTING FUEL STORAGE

PLAN NORTH

SITE PLAN

1" = 20'

0 10 20 40

LEGEND

WORK AREA OF IMPROVEMENTS

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SHEET CONTENTS

SITE PLAN

SHEET NO. 3 of 13

C-101

O:\30543-00\10001\TECH\CAD\DOCK IMPROVEMENTS\DWG\C-101 SITE PLAN.DWG

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STRUCTURAL DESIGN CRITERIA:

1. *GOVERNING CODE: 2006 INTERNATIONAL BUILDING CODE (IBC) / ASCE 7-05

2. EARTHQUAKE DESIGN DATA

   OCCUPANCY CATEGORY: I
   IMPORTANCE FACTOR: Ie = 1.00

   MAPPED, MCE, 5% DAMPED, SPECTRAL ACCELERATIONS:
   AT SHORT PERIODS: Ss = 1.411 G SDs = 0.941 G
   AT A PERIOD OF 1 SECOND: S_1 = 0.516 G SD_1 = 0.516 G

   SITE CLASS: D

   SEISMIC DESIGN CATEGORY: SDC = D
   EQUIVALENT LATERAL FORCE PROCEDURE

3. WIND LOADS: 130 MPH EXP C

4. LIVE LOADS: 60 PSF AT VAULT COVERS, PLATFORMS AND WALKWAYS, UNO.
   MOORING LOAD = 90,000 LB (ULTIMATE STRENGTH OF MOORING LINE)

5. MAX VESSEL DEAD WEIGHT TONNAGE: 5000 TONS
   (CURRENT VESSEL - TUSTUMENA - 4,593 TONS)

6. GEOTECHNICAL DATA:
   NO PROJECT SPECIFIC BORINGS HAVE BEEN PERFORMED. THE GEOTECHNICAL INFORMATION IS LIMITED TO A GENERALIZED GEOLOGIC CROSS SECTION INCLUDED ON DRAWING 3 OF 10 FOR THE ORIGINAL DOCK CONSTRUCTION. IN THE AREA OF THE PROPOSED NEW MOORING BOLLARD THE PROFILE SHOWED AS FOLLOWS: WATER TO EL. -10; SILTY SAND TO EL.-20; SANDY SILT TO EL. -50; DENSE SILTY SAND & GRAVEL TO EL.-60; BASALT AT EL.-60. THE ORIGIN OF THIS INFORMATION IS NOT KNOWN. THE PLANS FOR THE BREAKWATER EXPANSION PLANS PREPARED BY TRYCK NYMAN HAYES, INC. INCLUDED PILE INSTALLATIONS FOR THE FAR WEST MOORING DOLPHIN. A NOTE ON THE PLANS LABELING THE PILE STATES "DRIVE TO REFUSAL -160' +/-". THIS NOTE WOULD INDICATE A MUCH THICKER LAYER OF OVERBURDEN SOILS THAN THE ORIGINAL DOCK DESIGN PLANS.

SHOP DRAWINGS

SD-1. SHOP DRAWINGS SHALL BE SUBMITTED AS REQUIRED BY THE SPECIFICATIONS. CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS.

SD-2. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS AND PRODUCT DATA FOR CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTAL. REVIEWED SUBMITTALS SHALL BE STAMPED BY THE CONTRACTOR. ANY SHOP DRAWING OR PRODUCT DATA NOT REVIEWED AND STAMPED BY THE GENERAL CONTRACTOR WILL BE REJECTED. GENERAL CONTRACTOR SHALL CLOUD OR FLAG ALL ITEMS NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SHALL VERIFY ALL DIMENSIONS.

SD-3. ANY CHANGES, SUBSTITUTIONS OR DEVIATIONS FROM THE ORIGINAL CONTRACT DRAWINGS SHALL BE CLOUDED BY THE MANUFACTURER OR FABRICATOR. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS WHICH ARE CLOUDED OR FLAGGED BY SUBMITTING PARTIES SHALL NOT BE CONSIDERED APPROVED AFTER THE ENGINEER'S REVIEW, UNLESS SPECIFICALLY NOTED ACCORDINGLY BY THE ENGINEER.

SD-4. THE APPROVED SHOP DRAWINGS DO NOT REPLACE THE ORIGINAL CONTRACT DRAWINGS. ITEMS OMITTED OR SHOWN INCORRECTLY ARE NOT TO BE CONSIDERED CHANGES TO THE ORIGINAL CONTRACT DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ITEMS OMITTED OR SHOWN INCORRECTLY ARE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

SD-5. SHOP DRAWING REVIEW IS INTENDED ONLY FOR GENERAL CONFORMANCE TO THE DESIGN CONCEPT AND CONSTRUCTION DOCUMENTS. CORRECT DIMENSIONING OF ALL ELEMENTS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.

STRUCTURAL TESTING AND INSPECTION:

STI-1. REFER TO TESTING AND INSPECTION NOTES, SHEET G-002, FOR GENERAL TESTING AND INSPECTION NOTES.

STI-2. INSPECTION FIRM SHALL INSPECT FOR CONFORMANCE TO SPECIFIED REQUIREMENTS FOR PROTECTING NEW CONCRETE FROM THE ADVERSE EFFECTS OF WEATHER, HEATING EQUIPMENT AND OTHER POTENTIALLY HARMFUL CONDITIONS.

STI-3. CONSTRUCTION TESTING AND INSPECTION BY THE TESTING AND INSPECTION FIRM IS REQUIRED AS FOLLOWS:

A. CONCRETE TESTING IN ACCORDANCE WITH SPECIFICATIONS

B. CONCRETE INSPECTION IN ACCORDANCE WITH SPECIFICATIONS INCLUDING BUT NOT LIMITED TO: THE PLACEMENT OF REINFORCEMENT, REINFORCING BAR SIZES, SPACING, TIES, LAPS, COVER, EMBEDDED ITEMS, ANCHOR BOLTS, AND CONCRETE PLACEMENT.

C. STEEL INSPECTION IN ACCORDANCE WITH SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO: HIGH STRENGTH BOLTS, WELDING, MATERIAL VERIFICATION, PILE SPLICING AND CONNECTIONS.

D. STEEL CONDUIT LINING IN ACCORDANCE WITH SPECIFICATIONS

E. STRUCTURE FOUNDATION EXCAVATION AND BACKFILL IN ACCORDANCE WITH SPECIFICATIONS.

F. ROCK ANCHOR INSPECTION AND TESTING IN ACCORDANCE WITH SPECIFICATIONS.

G. CONTINUOUS INSPECTION OF EPOXY INJECTED ANCHOR INSTALLATION PER APPROVED INTERNATIONAL CODE COUNCIL (ICC) EVALUATION REPORT.

STEEL PIPE RAILINGS

SPR-1. PERFORMANCE REQUIREMENTS

A. STRUCTURAL PERFORMANCE: RAILINGS, INCLUDING ATTACHMENT TO WALKWAY CONSTRUCTION, SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND THE FOLLOWING LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED:

1. HANDRAILS AND TOP RAILS OF GUARDS:

   a. UNIFORM LOAD OF 50 LBF/ FT. (0.73 KN/M) APPLIED IN ANY DIRECTION.

   b. CONCENTRATED LOAD OF 200 LBF (0.89 KN) APPLIED IN ANY DIRECTION.

   c. UNIFORM AND CONCENTRATED LOADS NEED NOT BE ASSUMED TO ACT CONCURRENTLY.

2. INFILL OF GUARDS:

   a. CONCENTRATED LOAD OF 50 LBF (0.22 KN) APPLIED HORIZONTALLY ON AN AREA OF 1 SQ. FT. (0.093 SQ. M).

   b. INFILL LOAD AND OTHER LOADS NEED NOT BE ASSUMED TO ACT CONCURRENTLY.

SPR-2. STEEL

A. PIPE: ASTM A 53/A 53M, TYPE F OR TYPE S, GRADE A, STANDARD WEIGHT (SCHEDULE 40), UNLESS ANOTHER GRADE AND WEIGHT ARE REQUIRED BY STRUCTURAL LOADS.

3. PROVIDE GALVANIZED FINISH FOR EXTERIOR INSTALLATIONS AND WHERE INDICATED.

SPR-3. FASTENERS

A. GENERAL: PROVIDE THE FOLLOWING:

1. HOT-DIP GALVANIZED RAILINGS: TYPE 304 STAINLESS-STEEL OR HOT-DIP ZINC-COATED STEEL FASTENERS COMPLYING WITH ASTM A 153/A 153M OR ASTM F 2329 FOR ZINC COATING.

B. POST-INSTALLED ANCHORS: TORQUE-CONTROLLED EXPANSION ANCHORS CAPABLE OF SUSTAINING, WITHOUT FAILURE, A LOAD EQUAL TO 6 TIMES THE LOAD IMPOSED WHEN INSTALLED IN UNIT MASONRY AND 4 TIMES THE LOAD IMPOSED WHEN INSTALLED IN CONCRETE, AS DETERMINED BY TESTING ACCORDING TO ASTM E 488/E 488M, CONDUCTED BY A QUALIFIED INDEPENDENT TESTING AGENCY.

2. MATERIAL FOR EXTERIOR LOCATIONS AND WHERE STAINLESS STEEL IS INDICATED: ALLOY GROUP 1 (A1) STAINLESS-STEEL BOLTS, ASTM F 593 (ASTM F 738M), AND NUTS, ASTM F 594 (ASTM F 836M).

SPR-4. INSTALLATION, GENERAL

A. SET RAILINGS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; MEASURED FROM ESTABLISHED LINES AND LEVELS AND FREE OF RACK.

1. SET POSTS PLUMB WITHIN A TOLERANCE OF 1/16 INCH IN 3 FEET (2 MM IN 1 M).

2. ALIGN RAILS SO VARIATIONS FROM LEVEL FOR HORIZONTAL MEMBERS AND VARIATIONS FROM PARALLEL WITH RAKE OF STEPS AND RAMPS FOR SLOPING MEMBERS DO NOT EXCEED 1/4 INCH IN 12 FEET (6 MM IN 3.5 M).

B. CONTROL OF CORROSION: PREVENT GALVANIC ACTION AND OTHER FORMS OF CORROSION BY INSULATING METALS AND OTHER MATERIALS FROM DIRECT CONTACT WITH INCOMPATIBLE MATERIALS.

METAL BAR GRATINGS

MBG-1 STRUCTURAL PERFORMANCE

A. GRATINGS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND THE FOLLOWING LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED.

B. WALKWAYS AND ELEVATED PLATFORMS OTHER THAN EXITS: UNIFORM LOAD OF 100 LBF/SQ. FT.

MBG-2 SEISMIC PERFORMANCE:

A. PROVIDE GRATINGS CAPABLE OF WITHSTANDING THE EFFECTS OF EARTHQUAKE MOTIONS DETERMINED ACCORDING TO ASCE/SEI 7.

MBG-3 SUBMIT PRODUCT DATA: FOR THE FOLLOWING:

A. FORMED-METAL BAR GRATINGS.

B. CLIPS AND ANCHORAGE DEVICES FOR GRATINGS.

MBG-4 METAL BAR GRATING STANDARDS

A. COMPLY WITH NAAMM MBG 532, "HEAVY-DUTY METAL BAR GRATING MANUAL."

MBG-5 FERROUS METALS

A. STEEL PLATES, SHAPES, AND BARS: ASTM A 36/A 36M.

B. STEEL BARS FOR BAR GRATINGS: ASTM A 36/A 36M OR STEEL STRIP, ASTM A 1011/A 1011M OR ASTM A 1018/A 1018M.

C. WIRE ROD FOR BAR GRATING CROSSBARS: ASTM A 510.

D. GALVANIZED-STEEL SHEET: ASTM A 653/A 653M, STRUCTURAL QUALITY, GRADE 33, WITH G90 COATING.

MBG-6 FASTENERS

A. GENERAL: UNLESS OTHERWISE INDICATED, PROVIDE TYPE 316 STAINLESS-STEEL FASTENERS FOR EXTERIOR USE. SELECT FASTENERS FOR TYPE, GRADE, AND CLASS REQUIRED.

B. POST-INSTALLED ANCHORS: TORQUE-CONTROLLED EXPANSION ANCHORS CAPABLE OF SUSTAINING, WITHOUT FAILURE, A LOAD EQUAL TO SIX TIMES THE LOAD IMPOSED WHEN INSTALLED IN UNIT MASONRY AND FOUR TIMES THE LOAD IMPOSED WHEN INSTALLED IN CONCRETE, AS DETERMINED BY TESTING ACCORDING TO ASTM E 488, CONDUCTED BY A QUALIFIED INDEPENDENT TESTING AGENCY.

MBG-7 METAL BAR GRATINGS

A. WELDED STEEL GRATING:

1. BEARING BAR SPACING: 1-3/16 INCHES O.C.

2. BEARING BAR DEPTH: AS REQUIRED TO COMPLY WITH STRUCTURAL PERFORMANCE REQUIREMENTS AND INDICATED SPAN CONDITIONS.

3. BEARING BAR THICKNESS: 3/16 INCH.

4. CROSSBAR SPACING: 4 INCHES O.C.

5. TRAFFIC SURFACE: SERRATED.

6. STEEL FINISH: HOT-DIP GALVANIZED WITH A COATING WEIGHT OF NOT LESS THAN 1.8 OZ./SQ. FT. OF COATED SURFACE.

B. REMOVABLE OR HINGED GRATING SECTIONS: FABRICATE WITH BANDING BARS ATTACHED BY WELDING TO ENTIRE PERIMETER OF EACH SECTION. INCLUDE ANCHORS, HINGES AND FASTENERS OF TYPE INDICATED OR, IF NOT INDICATED, AS RECOMMENDED BY MANUFACTURER FOR ATTACHING TO SUPPORTS.

C. FABRICATE CUTOUTS IN GRATING SECTIONS FOR PENETRATIONS INDICATED. ARRANGE CUTOUTS TO PERMIT GRATING REMOVAL WITHOUT DISTURBING ITEMS PENETRATING GRATINGS.

1. EDGE-BAND OPENINGS IN GRATING THAT INTERRUPT FOUR OR MORE BEARING BARS WITH BARS OF SAME SIZE AND MATERIAL AS BEARING BARS.

D. DO NOT NOTCH BEARING BARS AT SUPPORTS TO MAINTAIN ELEVATION.

MBG-8 INSTALLATION, GENERAL

A. CUTTING, FITTING, AND PLACEMENT: PERFORM CUTTING, DRILLING, AND FITTING REQUIRED FOR INSTALLING GRATINGS. SET UNITS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; MEASURED FROM ESTABLISHED LINES AND LEVELS AND FREE OF RACK.

B. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FORM HAIRLINE JOINTS.

2. WELD CONNECTIONS THAT ARE NOT TO BE LEFT AS EXPOSED JOINTS BUT CANNOT BE SHOP WELDED BECAUSE OF SHIPPING SIZE LIMITATIONS. DO NOT WELD, CUT, OR ABRADE THE SURFACES OF EXTERIOR UNITS THAT HAVE BEEN HOT-DIP GALVANIZED AFTER FABRICATION AND ARE FOR BOLTED OR SCREWED FIELD CONNECTIONS.

MBG-9 INSTALLING METAL BAR GRATINGS

A. GENERAL: INSTALL GRATINGS TO COMPLY WITH RECOMMENDATIONS OF REFERENCED METAL BAR GRATING STANDARDS THAT APPLY TO GRATING TYPES AND BAR SIZES INDICATED, INCLUDING INSTALLATION CLEARANCES AND STANDARD ANCHORING DETAILS.

B. ATTACH REMOVABLE UNITS TO SUPPORTING MEMBERS WITH TYPE AND SIZE OF CLIPS AND FASTENERS INDICATED OR, IF NOT INDICATED, AS RECOMMENDED BY GRATING MANUFACTURER FOR TYPE OF INSTALLATION CONDITIONS SHOWN.

C. ATTACH NONREMOVABLE UNITS TO SUPPORTING MEMBERS BY WELDING WHERE BOTH MATERIALS ARE SAME; OTHERWISE, FASTEN BY BOLTING AS INDICATED ABOVE.

MBG-10 ADJUSTING AND CLEANING

A. GALVANIZED SURFACES: CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS AND REPAIR GALVANIZING TO COMPLY WITH SPECICATION 504

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CHECKED BY: JJB/NDR
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SHEET CONTENTS
STRUCTURAL NOTES

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S-001

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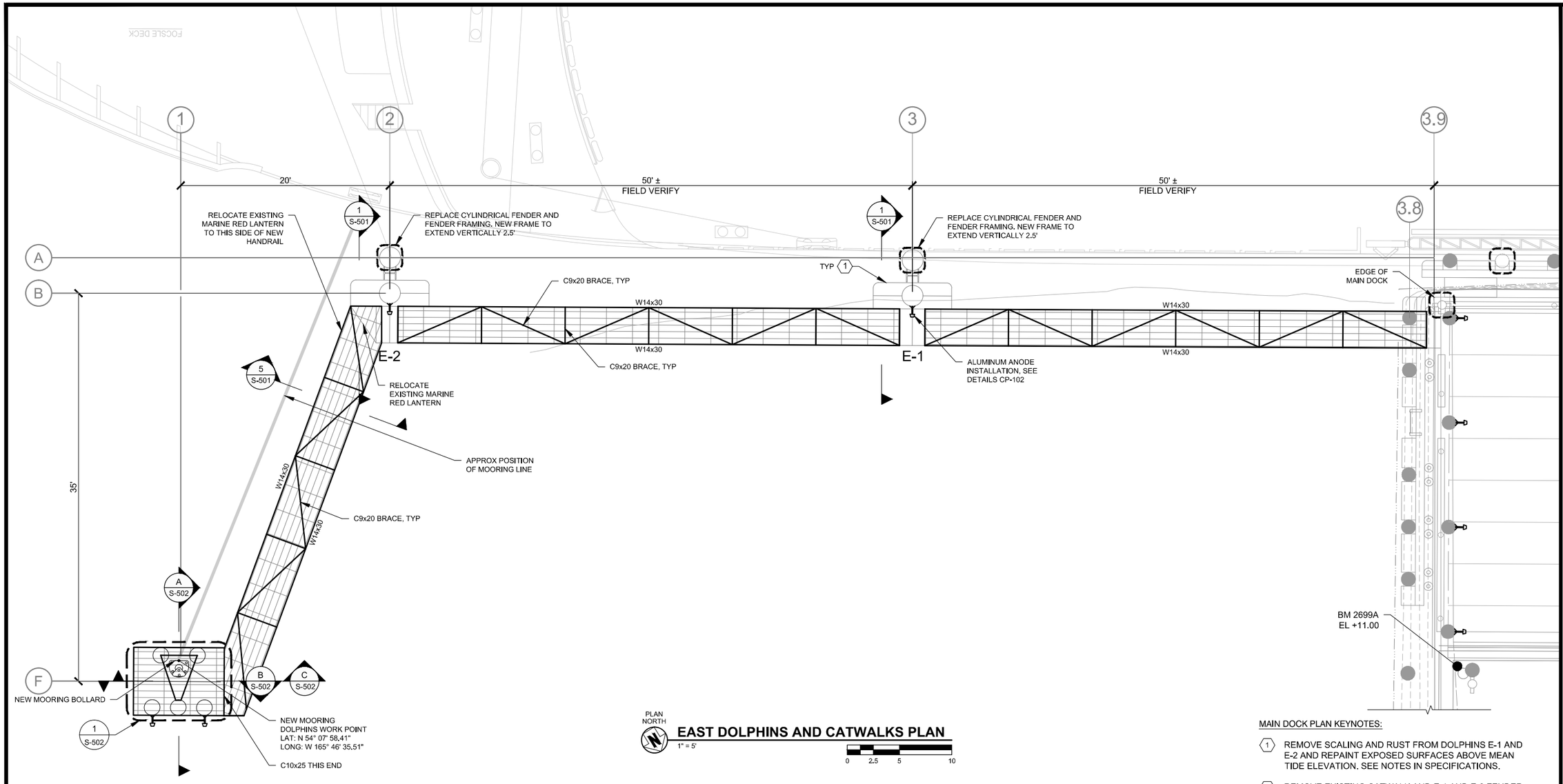

PLAN NORTH

EAST DOLPHINS AND CATWALKS PLAN

1" = 5'

0 2.5 5 10

MAIN DOCK PLAN KEYNOTES:

1. REMOVE SCALING AND RUST FROM DOLPHINS E-1 AND E-2 AND REPAINT EXPOSED SURFACES ABOVE MEAN TIDE ELEVATION. SEE NOTES IN SPECIFICATIONS.
2. REMOVE EXISTING CATWALK AND E-1 AND E-2 FENDER SYSTEMS AND DISPOSE OF.

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SHEET CONTENTS

EAST DOLPHINS PLAN

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S-101

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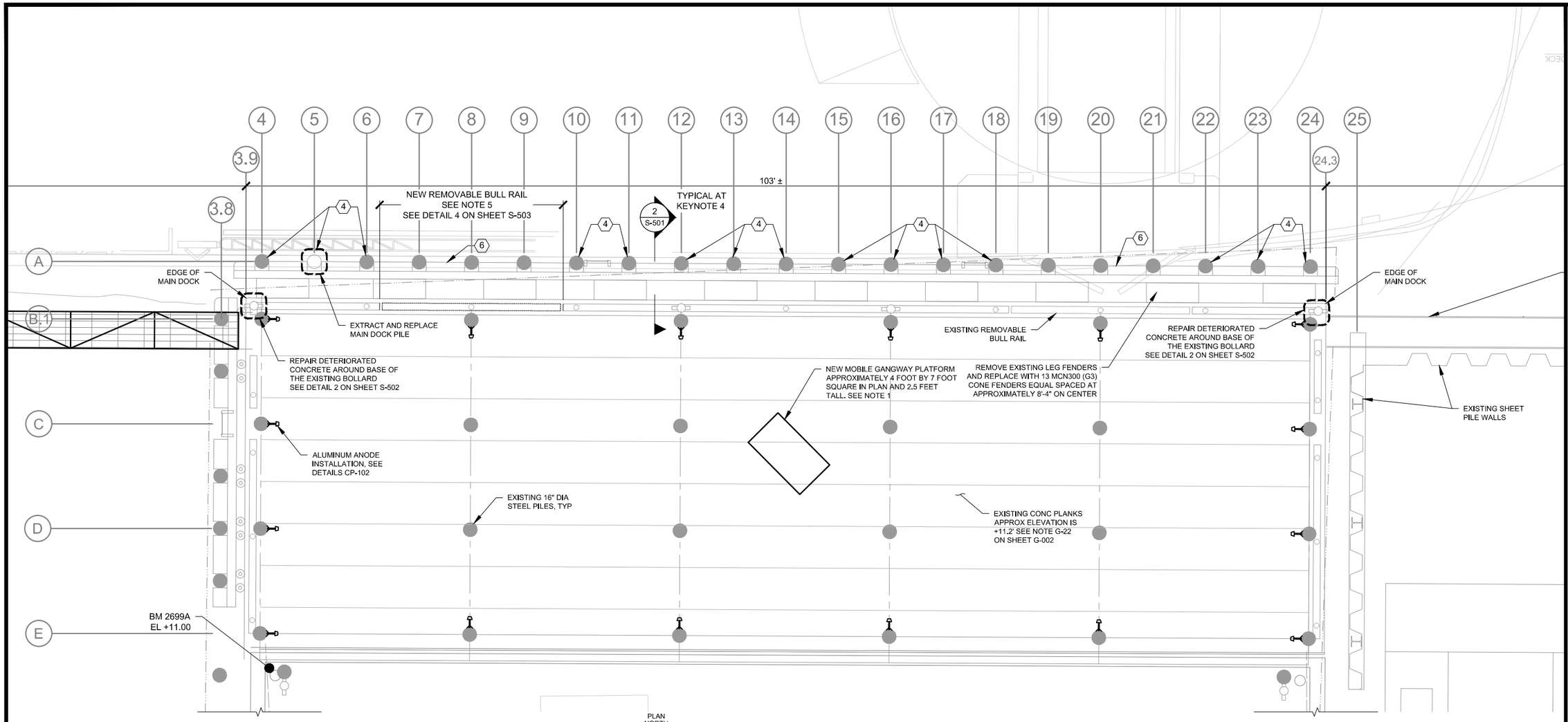

PLAN NORTH

MAIN DOCK PLAN

1" = 5'

0 2.5 5 10

MAIN DOCK PLAN KEYNOTES:

1. CONTRACTOR TO PROVIDE NEW GANG WAY PLATFORM CAPABLE OF SUPPORTING 3000 LB, SEE DETAIL 6, S-502.
2. REMOVE SCALING AND RUST FROM BEAMS AND PILES OF THE FENDERING SYSTEM AS WELL AS DECK SUPPORT FRAMING AND REPAINT EXPOSED SURFACES ABOVE MEAN TIDE ELEVATION, SEE NOTES IN SPECIFICATIONS FOR COATING SYSTEMS.
3. REPLACE ALL TOP CAP PLATES OF UNRAISED FENDER PILES. NEW PLATE SHOULD MATCH DIAMETER OF EXISTING PILE. SEE DETAIL 7 ON SHEET S-501. PROVIDE NEW CHANNEL PILE CONNECTION TO TOP OF PILE. SEE DETAIL 8 ON SHEET S-501.
4. EXTEND PILES AND FENDERING SYSTEM VERTICALLY 2.5' SEE DETAIL 2 ON SHEET S-501.
5. PROVIDE NEW 15'± SECTION OF REMOVABLE BULL RAIL, SIMILAR TO SECTION BETWEEN GRIDS 18 AND 22. REFER TO DETAIL 4 ON SHEET S-503.
6. REMOVE AND DISPOSE OF ALL TIMBER BLOCKING/FENDERS BETWEEN EXISTING FENDER PILES.

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MAIN DOCK PLAN

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S-102

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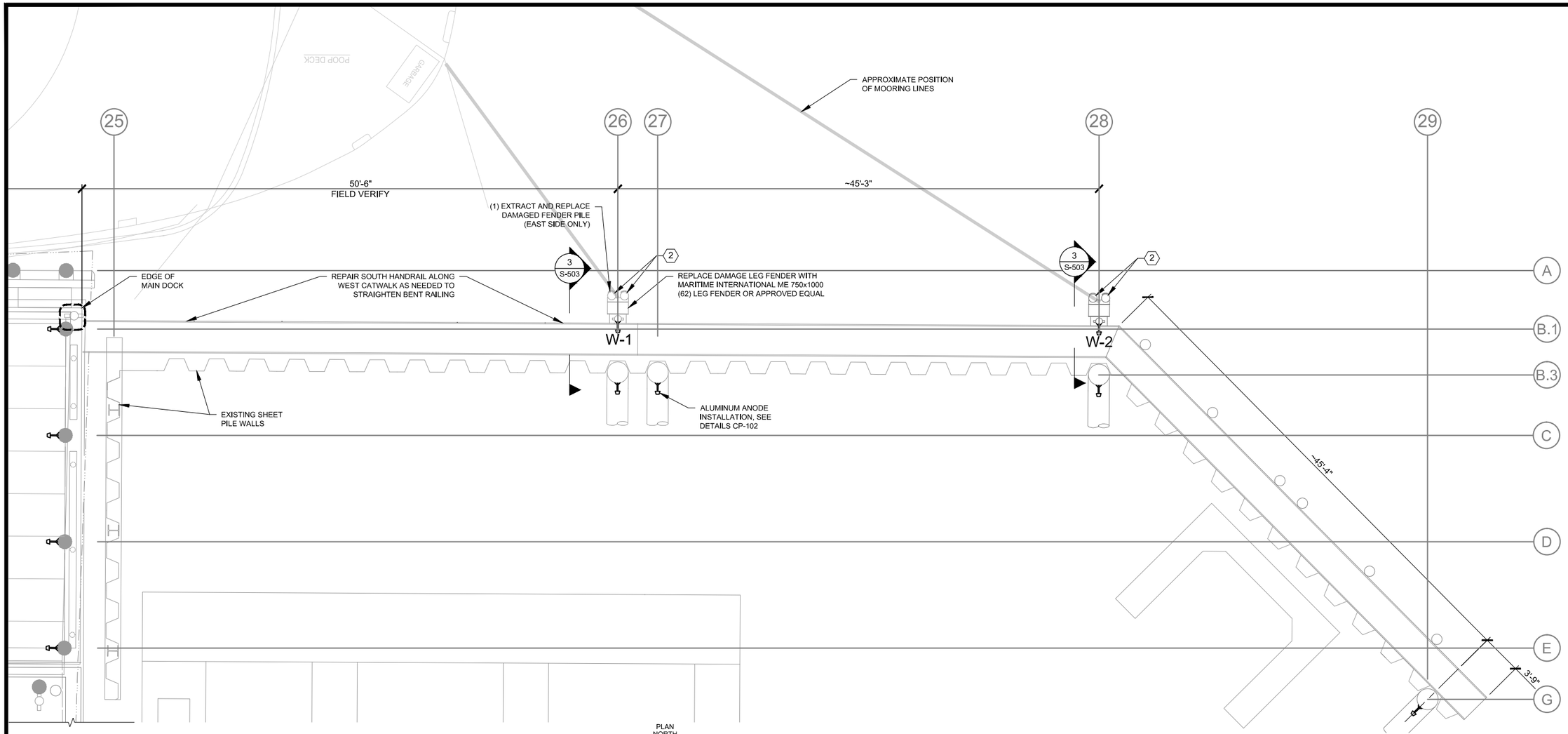

PLAN NORTH

WEST DOLPHIN PLAN

1" = 5'

0 2.5 5 10

WEST DOLPHIN PLAN KEYNOTES:

1. REMOVE SCALING AND RUST FROM BEAMS AND PILES OF THE FENDERING SYSTEM AS WELL AS DECK SUPPORT FRAMING AND REPAINT EXPOSED SURFACES ABOVE MEAN TIDE ELEVATION. SEE NOTES IN SPECIFICATIONS FOR COATING SYSTEMS.
2. EXTEND PILES AND FENDERING SYSTEM VERTICALLY 2.5' SEE DETAIL 3 ON SHEET S-503.

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SHEET CONTENTS

WEST DOLPHINS PLAN

SHEET NO. 7 of 13

S-103

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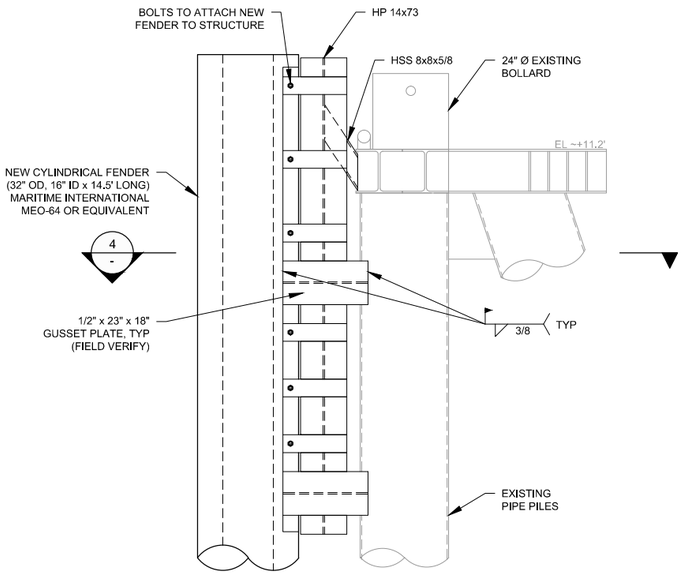
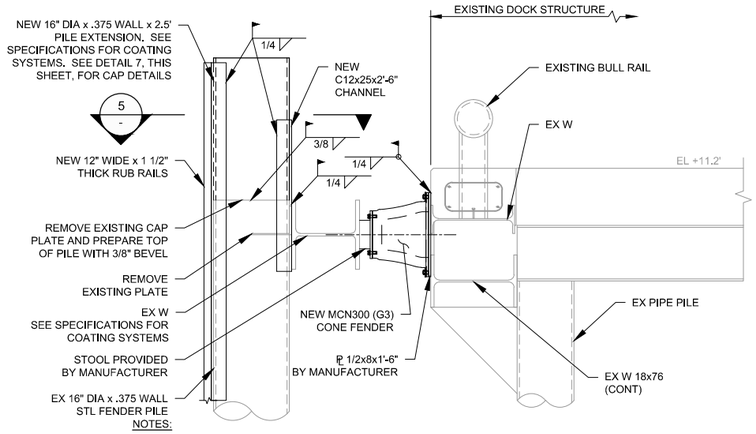


1 MOORING DOLPHIN E1 & E2

1/2" = 1'-0"

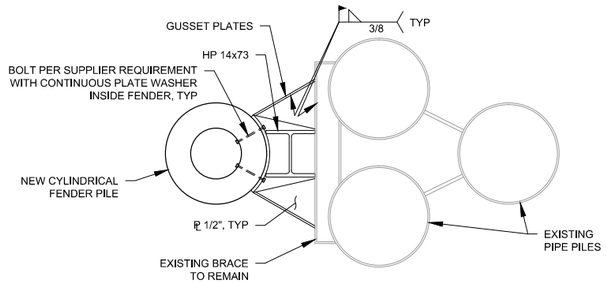


NOTES:

1. RUB RAILS TO BE MARITIME INTERNATIONAL UHMW PANELS OR APPROVED EQUAL.
2. REMOVE EXISTING FENDER (NOT SHOWN FOR CLARITY).

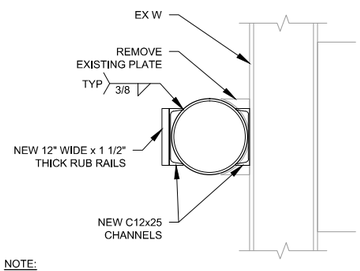
2 FENDER PILE EXTENSION AT MAIN DOCK

3/4" = 1'-0"



3 SECTION

1/2" = 1'-0"

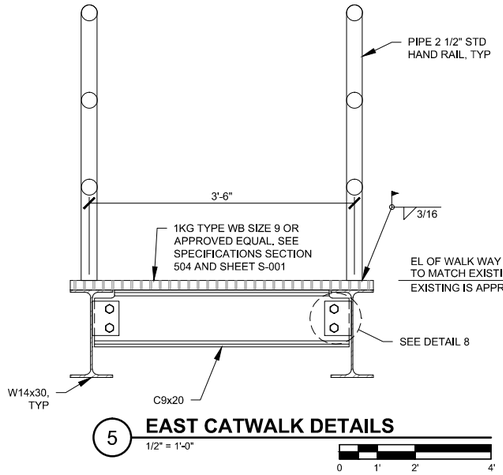


NOTE:

1. NEW RUB RAIL AND MOUNTING CHANNEL TO EXTEND FROM TOP OF THE PILE TO EL 0.0 MLLW.

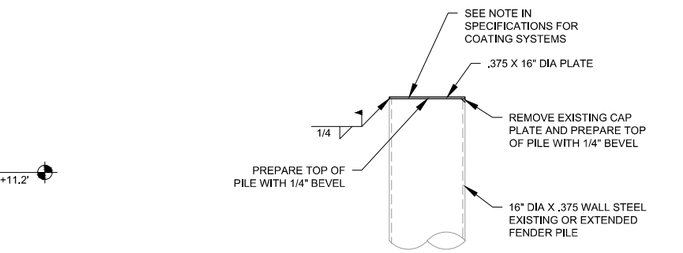
4 SECTION

3/4" = 1'-0"



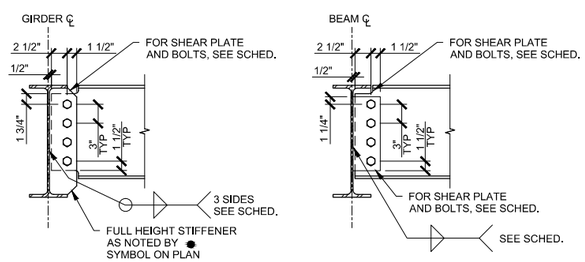
5 EAST CATWALK DETAILS

1/2" = 1'-0"



6 MAIN DOCK PILE CAP REPLACEMENT AT PILES NOT EXTENDED

3/4" = 1'-0"



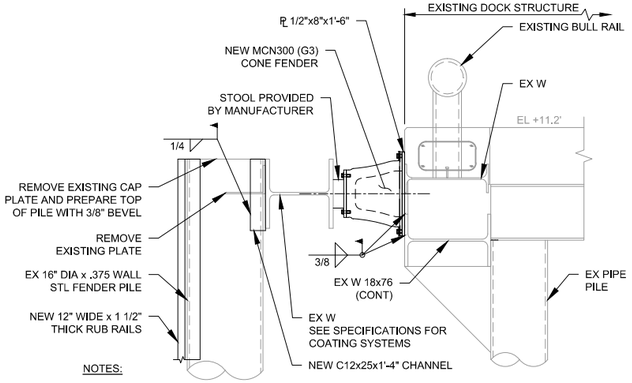
STANDARD BOLTED CONNECTION SCHEDULE			
BEAM SIZE	NO. & SIZE OF BOLTS REQUIRED	PLATE THICKNESS	WELD SIZE
W8 C8	(2) 7/8" DIA	1/4"	1/4"
C9	(2) 7/8" DIA	5/16"	1/4"
W10 C10	(2) 7/8" DIA	5/16"	1/4"
W12 C12	(3) 7/8" DIA	3/8"	1/4"
W14	(3) 7/8" DIA	3/8"	1/4"
W16	(4) 7/8" DIA	3/8"	5/16"
W18	(5) 7/8" DIA	3/8"	5/16"
W21	(6) 7/8" DIA	3/8"	5/16"
W24	(6) 7/8" DIA	1/2"	3/8"
W27	(7) 7/8" DIA	1/2"	3/8"

NOTES:

1. ALL BOLTS TO BE ASTM A325-SC FULLY PRETENSIONED AND INSPECTED PER AISC.
2. CONNECTION PLATES TO HAVE AISC STANDARD ROUND HOLES UNLESS NOTED OTHERWISE.
3. REFER TO COPING DETAIL THIS SHEET FOR CONNECTIONS WHERE COPING IS REQUIRED. CHECK COPE DEPTH PRIOR TO FABRICATION.
4. FOR W8 AND W12 MEMBERS, BOLT SPACING IS PERMITTED TO BE 2 3/4".
5. REFER TO TYP. STIFFENER PLATE DETAIL THIS SHEET FOR PLATE CORNER CLIP.
6. WHERE BEAMS FRAME INTO A COLUMN, KNIFE PLATE CONN. SHALL BE USED. THE HEAVIEST BEAM SECTION SHALL BE PROVIDED WITH THE KNIFE PLATE CONN.
7. "WT" CONNECTION SHALL BE USED ONLY AT COLUMNS WHERE KNIFE PLATE CONN. IS BEING USED FOR HEAVIER BEAMS.
8. SEE DETAIL 5/S-511 FOR TYP. CAP PLATE AT COLUMN END WHERE COLUMN DOES NOT CONTINUE.
9. SEE "DRAG CONN." FOR REQUIREMENTS WHERE SYMBOL IS NOTED ON PLAN.
10. REFER TO DETAIL 5/S-511 FOR CAP PLATE.

7 EAST CATWALK CONNECTION DETAIL

1" = 1'-0"



NOTES:

1. RUB RAILS TO BE MARITIME INTERNATIONAL UHMW PANELS OR APPROVED EQUAL.
2. REMOVE EXISTING FENDER (NOT SHOWN FOR CLARITY).

8 FENDER PILE AT MAIN DOCK

3/4" = 1'-0"

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STRUCTURAL DETAILS

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S-501

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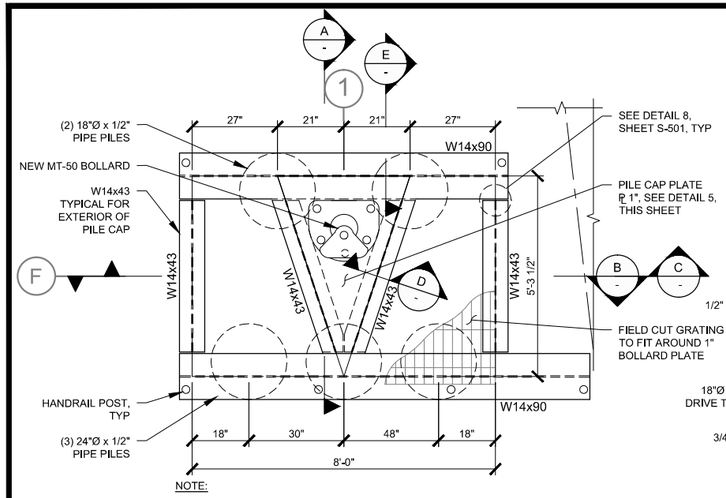


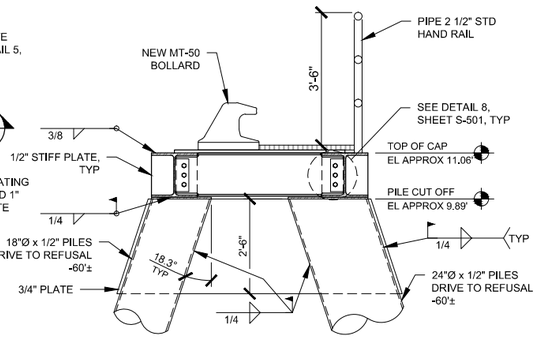
NOTE:

1. SEE DETAILS D-G, THIS SHEET, FOR PILE CAP CONNECTIONS.

1 PILE CAP PRELIM LAYOUT

1" = 2'

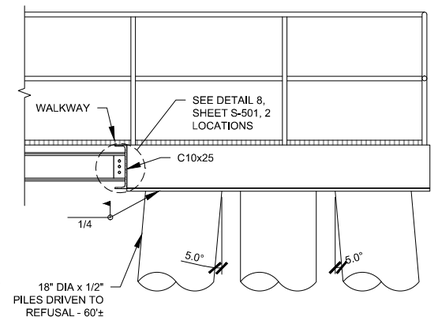
0 1 2 4



A SECTION THROUGH PIPE CAP

1/2" = 1'-0"

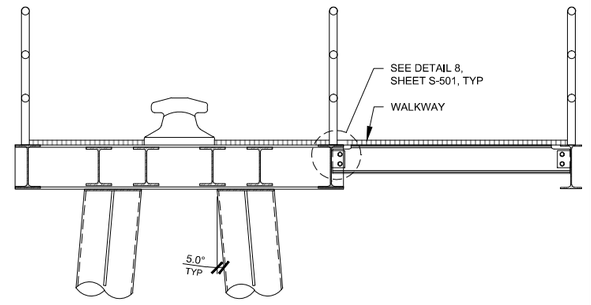
0 1' 2' 4'



B SECTION NORTHERN PILES

1/2" = 1'-0"

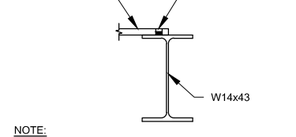
0 1' 2' 4'



C SECTION SOUTHERN PILES

1/2" = 1'-0"

0 1' 2' 4'



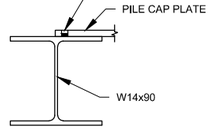
NOTE:

1. WELD TO BE GROUND SMOOTH.

D PILE CAP PLATE CONNECTION DETAIL

1" = 1'-0"

0 1/2' 1' 2'



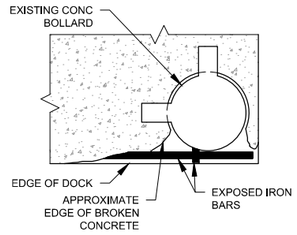
NOTE:

1. WELD TO BE GROUND SMOOTH.

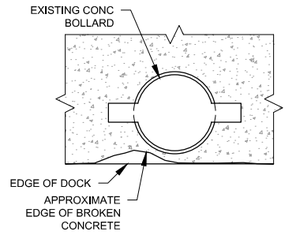
E PILE CAP PLATE CONNECTION DETAIL

1" = 1'-0"

0 1/2' 1' 2'



EXISTING CONDITION AT CORNER



EXISTING CONDITION ALONG SIDE

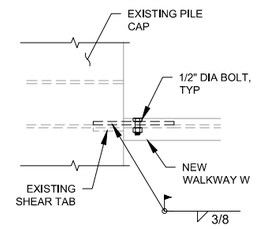
NOTES:

1. REMOVE ALL SPALLS AND DELAMINATION TO SOUND CONCRETE.
2. REMOVE ALL RUST AND SCALING FROM EXPOSED REBAR.
3. FOR EXPOSED REBAR WITH SECTION LOSS OF MORE THAN 25%, DOWEL IN ANCHOR OF EXISTING SIZE INWARD OF EXPOSED CONCRETE EDGE. SEE S-001 FOR CONCRETE AND REPAIR NOTES. USE EMBEDMENT LENGTH REQUIRED FOR DOWEL SIZE USED. EPOXY DOWEL INTO SOUND CONCRETE.
4. REPLACE DAMAGED CONCRETE PER CONCRETE AND REPAIR NOTES IN THE SPECIFICATIONS, SECTION 501

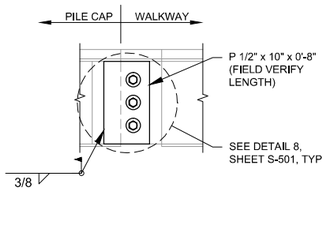
2 CONC BALLARD REPAIR

1" = 1'-0"

0 1/2' 1' 2'



PLAN VIEW



SECTION VIEW

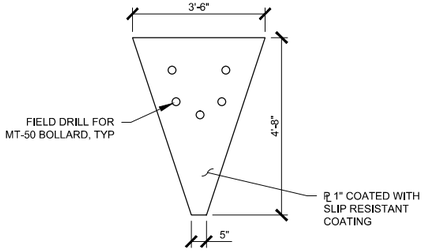
NOTES:

1. CUT EXISTING SHEAR TAB FLUSH WITH EXISTING PILE CAP.
2. PROVIDE NEW SHEAR WELDED SHEAR TAB ON OPPOSITE SIDE OF CAP FLANGE.
3. BOLT WALKWAY BEAM TO NEW SHEAR TAB.

3 NEW EAST CATWALK SHEAR CONNECTIONS

1" = 1'-0"

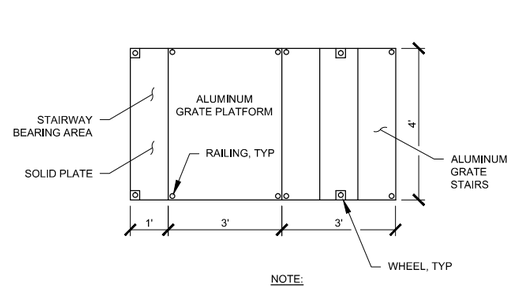
0 1/2' 1' 2'



5 PILE CAP PLATE

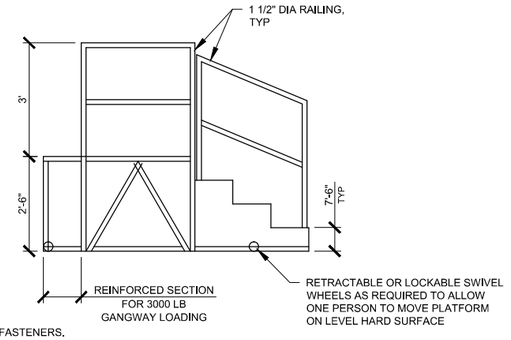
1" = 2'

0 1 2 4



NOTE:

1. ALL ALUMINUM FRAMING, COMPONENTS AND FASTENERS.
2. SEE NOTE 1, S-102.



6 GANGWAY LANDING SCHEMATIC

1" = 2'

0 1 2 4

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STRUCTURAL DETAILS

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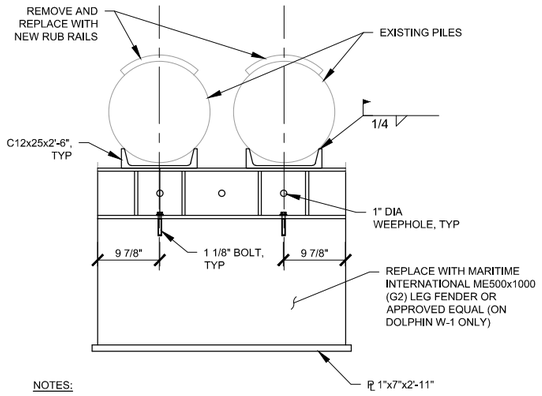


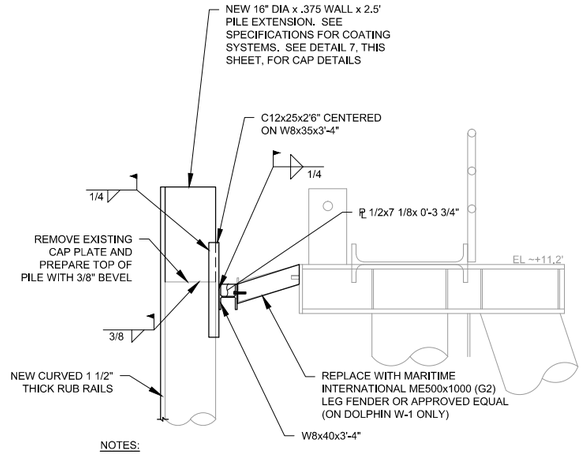
NOTES:

1. REMOVE EXISTING FENDER (NOT SHOWN FOR CLARITY).
2. RUB RAIL TO BE HDPE 1 ½ INCH THICK MATERIAL WITH 120 DEGREE COVERAGE BOLTED AT EDGES TO PILE EVERY 1'-6" ON CENTER. EXTEND FROM TOP OF PILE DOWN TO EL. 0.00 MLLW.

1 FENDER PILE CONNECTION AT WEST DOLPHIN

1" = 1'-0"

0 1/2' 1' 2'



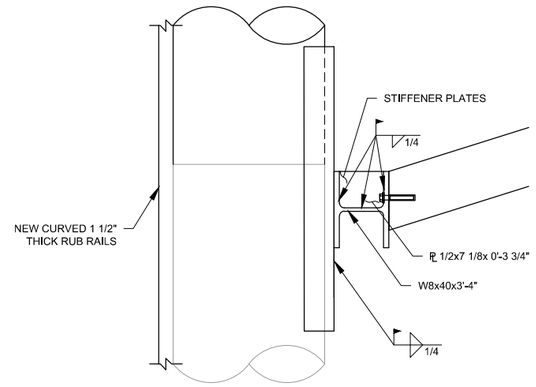
NOTES:

1. REMOVE EXISTING FENDER (NOT SHOWN FOR CLARITY).
2. RUB RAIL TO BE HDPE 1 ½ INCH THICK MATERIAL WITH 120 DEGREE COVERAGE BOLTED AT EDGES TO PILE EVERY 1'-6" ON CENTER. EXTEND FROM TOP OF PILE DOWN TO EL. 0.00 MLLW.

2 FENDER PILE EXTENSION AT WEST DOLPHINS

1/2" = 1'-0"

0 1' 2' 4'



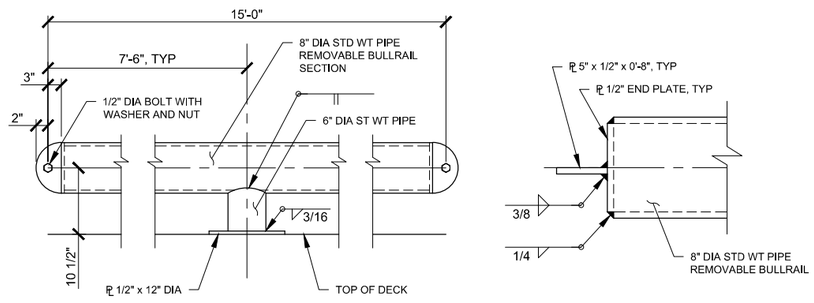
NOTES:

1. REMOVE EXISTING FENDER (NOT SHOWN FOR CLARITY).
2. RUB RAIL TO BE HDPE 1 ½ INCH THICK MATERIAL WITH 120 DEGREE COVERAGE BOLTED AT EDGES TO PILE EVERY 1'-6" ON CENTER. EXTEND FROM TOP OF PILE DOWN TO EL. 0.00 MLLW.

3 FENDER PILE EXTENSION AT WEST DOLPHINS

1 1/2" = 1'-0"

0' 6" 1' 1 1/2'



SECTION VIEW
1" = 1'-0"

END PLAN VIEW
1" = 6"

4 REMOVABLE BOLLARD DETAIL

1" = 1'-0"

0 1/2' 1' 2'

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CHECKED BY:	JJB/NDR

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SHEET CONTENTS

STRUCTURAL DETAILS

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S-503

PART 1 - GENERAL

1.1 SCOPE

A. THESE SPECIFICATIONS DEFINE MATERIALS AND INSTALLATION PRACTICES FOR THE GALVANIC CATHODIC PROTECTION SYSTEM FOR THE STEEL SHEET PILE AND PIPE PILE SYSTEM.

B. INSTALLATION OF CORROSION CONTROL COMPONENTS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, AND ACCOMPANYING DESIGN DRAWINGS. ALL INSTALLATION PRACTICES AND COMPONENTS SHALL BE APPROVED BY THE ENGINEER.

C. THE GALVANIC CATHODIC PROTECTION SYSTEM WILL CONSIST OF ALUMINUM ANODES INSTALLED ON THE WATER SIDE OF THE PIPE AND STEEL SHEET PILES.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING STRUCTURES PRIOR TO ANY WORK.

E. ALL WORK SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

1. NATIONAL ELECTRICAL CODE
2. ENVIRONMENTAL PROTECTION AGENCY
3. OCCUPATIONAL SAFETY AND HEALTH AGENCY

1.2 REFERENCES

A. THE PUBLICATIONS LISTED BELOW FORM A PART OF THIS SPECIFICATION TO THE EXTENT REFERENCED. THE PUBLICATIONS ARE REFERRED TO IN THE TEXT BY THE BASIC DESIGNATION ONLY.

B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
ASTM D1248 POLYETHYLENE PLASTICS EXTRUSION MATERIALS FOR WIRE AND CABLE

C. AMERICAN WELDING SOCIETY (AWS)
AWS D1.1 STRUCTURAL WELDING CODE - STEEL

D. NACE INTERNATIONAL (NACE)
NACE RP0169 CONTROL OF EXTERNAL CORROSION ON UNDERGROUND OR SUBMERGED METALLIC STRUCTURES

1.3 SUBMITTALS

A. SUBMIT THE FOLLOWING IN ACCORDANCE, "SUBMITTAL PROCEDURES".
1. CATALOG CUTS OF ALL MATERIALS TO BE INSTALLED SHALL BE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

2. SHOP DRAWINGS SHOWING ANODE CONNECTIONS.

3. QUALIFICATIONS OF INDEPENDENT CORROSION CONTROL FIRM INCLUDING TEST PERSONNEL AND NACE INTERNATIONAL CORROSION SPECIALIST QUALIFICATIONS, SHALL BE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

4. WELD PROCEDURES, WELDER CERTIFICATION, AND RECORDS OF 100% VISUAL INSPECTION OF WELDS.

5. TEST PROCEDURES AND EQUIPMENT LIST FOR POST INSTALLATION TESTING SHALL BE REQUIRED AND SUBMITTED FOR APPROVAL.

PART 2 - PRODUCTS

2.1 GALVANIC ANODES

A. THE GALVANIC ANODES SHALL BE ALUMINUM. EACH ANODE SHALL HAVE A NOMINAL WEIGHT OF 100 POUNDS. THE COMPOSITION OF THE HIGH PURITY ALUMINUM ANODE SHALL BE AS FOLLOWS:

INDIUM	0.01% TO 0.03%
SILICON	0.08% TO 0.2%
ZINC	2.8% TO 7.0%
COPPER	0.006% MAXIMUM
IRON	0.12 MAXIMUM
MERCURY	NONE
OTHERS	0.02 MAXIMUM
ALUMINUM*	REMAINDER (MINIMUM 99.85% PURITY)

B. EACH ANODE SHALL HAVE THE FOLLOWING DIMENSIONS:

LENGTH	60 INCHES
WIDTH	4 INCHES
HEIGHT	4 INCHES

C. EACH ANODE SHALL BE CAST ON A BENT STEEL MOUNTING STRAP AS SHOWN ON THE DESIGN DETAIL DRAWINGS. THE STEEL MOUNTING STRAP SHALL BE ¾-INCH PIPE. IT SHALL EXTEND 3.0 INCHES BEYOND EACH END OF THE ALUMINUM ANODE AND SHALL HAVE A 12-INCH OFFSET FOR MOUNTING TO THE PIPE PILE CLAMP.

D. THE ANODES SHALL BE SHIPPED ON WOODEN SKIDS. THE WOODEN SKIDS AND ANODES SHALL BE SEALED WITHIN HEAT SHRINK PLASTIC TO PREVENT DIRECT MOISTURE CONTACT TO THE ANODES DURING SHIPMENT AND STORAGE PRIOR TO INSTALLATION.

2.2 PIPE PILE ANODE MOUNTING CLAMP

A. THE PIPE PILE ANODE MOUNTING CLAMP SHALL BE FABRICATED AS SHOWN ON THE DRAWINGS DETAIL 1/CP-102.

2.3 ANODE BOND CONNECTION TO PIPE PILE

A. THE ANODE CONNECTION TO THE PILE WILL BE MADE UTILIZING THE SET SCREWS ON EACH CLAMP AND A REDUNDANT BOND CONNECTION AS SHOWN ON DETAILS 2 AND 3/CP-102.

PART 3.0 - EXECUTION

3.1 SHEET PILE AND PIPE PILE BONDING

A. ALL WELDING SHALL BE PERFORMED AND WELDERS CERTIFIED IN ACCORDANCE WITH AWS D1.1. COAT THE WELD AREA WITH THE SAME COATING MATERIAL THAT IS USED TO COAT THE WATERSIDE FACE OF THE PIPE PILES AND SHEET PILES.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING TO VERIFY ELECTRICAL CONTINUITY OF THE PILING. DOCUMENTATION OF SUCH TESTING SHALL BE SUBMITTED TO THE ENGINEER.

3.2 ALUMINUM ANODES

A. LOCATION OF ANODES SHALL BE AS SHOWN ON THE DRAWINGS.

B. THE CONTRACTOR SHALL WELD THE STAINLESS STEEL THREADOLET TO THE PILE, AS SHOWN ON THE DRAWINGS, PRIOR TO DRIVING THE PILE. ALL WELDING AND CERTIFICATION SHALL BE IN ACCORDANCE WITH AWS D1.1. REPAIR DAMAGED COATING AS RECOMMENDED BY THE COATING MANUFACTURER.

C. REMOVE THE ALUMINUM ANODES FROM THE SHIPPING CONTAINER AND VERIFY THAT ALL HEAT SHRINK PLASTIC HAS BEEN REMOVED FROM THE ANODE SURFACE.

D. INSTALL ANODES AS SHOWN ON THE DRAWINGS.

PART 4 - POST INSTALLATION TESTING

4.1 GENERAL

A. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT CORROSION CONTROL FIRM TO PERFORM ALL POST INSTALLATION TESTING OF THE CATHODIC PROTECTION SYSTEM.

B. THE INDEPENDENT CORROSION CONTROL FIRM SHALL PERFORM POST INSTALLATION TESTING OF THE CATHODIC PROTECTION SYSTEM. THE CATHODIC PROTECTION SYSTEM SHALL BE TESTED BY THE CONTRACTOR'S NACE CERTIFIED CORROSION SPECIALIST IN ACCORDANCE WITH THE FOLLOWING NACE INTERNATIONAL RECOMMENDED PRACTICE:

RP0169 CONTROL OF EXTERNAL CORROSION ON UNDERGROUND OR SUBMERGED METALLIC PIPING SYSTEMS

C. THE REPAIR OR REPLACEMENT OF ANY DEFECTIVE OR IMPROPERLY INSTALLED SYSTEMS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY AND ALL REPAIRS OR REPLACEMENT OF DEFECTIVE OR IMPROPERLY INSTALLED CATHODIC PROTECTION COMPONENTS SHALL BE PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST.

D. ALL WORK SHALL BE WITNESSED, AT THEIR OPTION AND DISCRETION, BY THE ENGINEER. THE ENGINEER SHALL BE NOTIFIED OF THE TEST DATE A MINIMUM OF TWO WEEKS PRIOR TO CONDUCTING OF ANY FINAL POST INSTALLATION TESTING.

4.2 QUALIFICATIONS

A. THE INDEPENDENT CORROSION CONTROL FIRM SHALL HAVE BEEN CONTINUOUSLY ENGAGED IN THE FIELD OF CORROSION CONTROL TESTING FOR A MINIMUM OF FIVE YEARS AND SHALL HAVE THE FOLLOWING QUALIFICATIONS:

1. NOT LESS THAN FIVE YEARS EXPERIENCE IN THE TESTING OF CATHODIC PROTECTION SYSTEMS OF SIMILAR TYPE AND EQUAL COMPLEXITY AS THE SYSTEM SPECIFIED AND INDICATED.

2. TESTED AT LEAST FIVE SUCCESSFUL CATHODIC PROTECTION SYSTEMS OF SIMILAR TYPE AND EQUAL COMPLEXITY AS THE SYSTEM SPECIFIED AND INDICATED.

3. TESTING SHALL BE PERFORMED BY PERSONNEL WITH AT LEAST THREE YEARS OF EMPLOYMENT EXPERIENCE WITH TESTING CATHODIC PROTECTION SYSTEMS.

4. THE POST INSTALLATION TESTING OF THE CATHODIC PROTECTION SYSTEM SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF A NACE INTERNATIONAL CERTIFIED CORROSION SPECIALIST OR CATHODIC PROTECTION SPECIALIST. THE TESTING, REPAIR OR REPLACEMENT OF ANY DEFECTIVE OR IMPROPERLY INSTALLED COMPONENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

ALL TESTING, AND ALL REPAIRS OR REPLACEMENT OF DEFECTIVE OR IMPROPERLY INSTALLED CATHODIC PROTECTION COMPONENTS SHALL BE PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. AT THE COMPLETION OF THE TESTING, SUBMIT ALL TEST REPORTS FOR REVIEW AND APPROVAL BY THE ENGINEER.

4.3 POST INSTALLATION TESTING

A. ANODE BOND CONNECTION CONTINUITY TEST PROCEDURES

1. THE VOLTAGE BETWEEN THE EACH ANODE AND THE PIPE PILE SHALL BE MEASURED WITH A HIGH IMPEDANCE (MINIMUM 10 MEGOHMS) DC VOLTMETER.

ACCEPTANCE CRITERION: THE MEASURED VOLTAGE SHALL HAVE A ZERO POTENTIAL READING BETWEEN THEM.

2. THE POTENTIAL MEASUREMENTS SHALL BE PERFORMED WITH THE FOLLOWING EQUIPMENT:
a. M.C. MILLER, MODEL M-3-A2 MULTIMETER OR EQUAL.
b. SILVER/SILVER CHLORIDE REFERENCE ELECTRODE. A COPPER/COPPER SULFATE REFERENCE ELECTRODE SHALL NOT BE USED.

B. STRUCTURE-TO-ELECTROLYTE POTENTIAL MEASUREMENTS

1. STRUCTURE-TO-ELECTROLYTE POTENTIAL MEASUREMENTS SHALL BE OBTAINED ALONG THE WATER SIDE FACE OF THE PIPE PILES AND SHEET PILES AFTER ALL OF THE ANODES ARE INSTALLED. POTENTIAL READINGS SHALL BE OBTAINED ADJACENT TO EACH PIPE PILE AT TWO DEPTHS (5 AND 15 FEET). THE POTENTIAL MEASUREMENTS SHALL BE PERFORMED WITH THE FOLLOWING EQUIPMENT:
a. M.C. MILLER, MODEL M-3-A2 MULTIMETER OR EQUAL.
b. SILVER/SILVER CHLORIDE REFERENCE ELECTRODE. A COPPER/COPPER SULFATE REFERENCE ELECTRODE SHALL NOT BE USED.

C. PREPARATION OF A FINAL TEST REPORT THAT INCLUDES ALL FINAL CATHODIC PROTECTION TEST DATA (TABULATED IN TYPE-WRITTEN FORMAT), A DESCRIPTION OF ALL TEST PROCEDURES, LEGIBLE SKETCHES OF TEST LOCATIONS, AND CONCLUSIONS AS TO THE CONDITION AND THE OPERATING STATUS AND EFFECTIVENESS OF THE CATHODIC PROTECTION SYSTEM. THE CATHODIC PROTECTION TEST DATA SHALL INCLUDE: ELECTRICAL CONTINUITY DATA AND STRUCTURE-TO-ELECTROLYTE POTENTIAL DATA. CERTIFICATION THAT THE CATHODIC PROTECTION SYSTEM IS FUNCTIONING SHALL BE INCLUDED. THE CONTRACTOR'S NACE CERTIFIED CORROSION SPECIALIST OR CATHODIC PROTECTION SPECIALIST SHALL SIGN THE TEST REPORT AND INCLUDE THEIR NACE CERTIFICATE NUMBER WITH THEIR SIGNATURE.

4.4 DEFECTIVE OR IMPROPERLY INSTALLED COMPONENTS

A. THE REPAIR OR REPLACEMENT OF ANY DEFECTIVE OR IMPROPERLY INSTALLED COMPONENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY AND ALL REPAIRS OR REPLACEMENT OF DEFECTIVE OR IMPROPERLY INSTALLED CATHODIC PROTECTION COMPONENTS SHALL BE PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST.

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SHEET CONTENTS
CATHODIC PROTECTION NOTES

CP-001

SALT HOUSE COVE

M/V TUSTUMENA

-40
-35
-30
-25
-20
-15
-10
-5

-47'-11"

INSPECT EXISTING ANODE SYSTEM SEE NOTE 1

EXISTING WALKWAY

ANODE BRACELETS SEE NOTE 1

NEW MOORING DOLPHIN AND GALVANIC ANODE SYSTEM SEE DETAIL 1/CP-102

EXIST MAIN DOCK

EXISTING 16" DIA STEEL PIPE PILES, TYP

EXIST WALKWAY

EXIST SHEET PILE WALL

EXIST FLOAT WALKWAY

EXIST GANGWAY

EXIST WALKWAY & SHEET PILE WALL

INSTALL GALVANIC ANODES ON SHEET PILE PER DETAIL 2/CP-102

INSTALL GALVANIC ANODES ON PIPE PILES/DOLPHINS PER DETAIL 1/CP-102

EXIST SHEET PILE WALL

EXIST STL SHEETPILE BULKHEAD

EXIST CONC BARGE

NOTE:

1. REMOVE ANY EXISTING SET SCREW ATTACHED ANODE BRACELETS. REPLACE BRACELET AND SECURELY WELD ANODE TO PIPE PER DETAIL. REPLACE ENTIRE ANODE IF MORE THAN 30% CONSUMED. NEW ANODES PER DETAIL 1/CP-102.

PLAN NORTH

PLAN VIEW

1" = 20'

0 10 20 40

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CATHODIC PROTECTION PLAN

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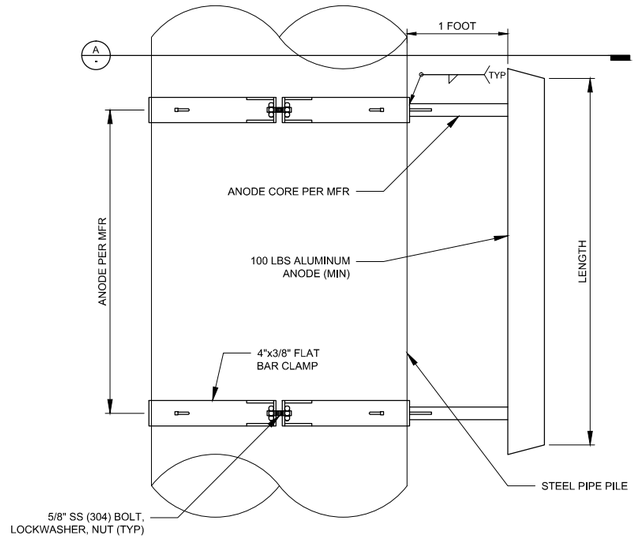
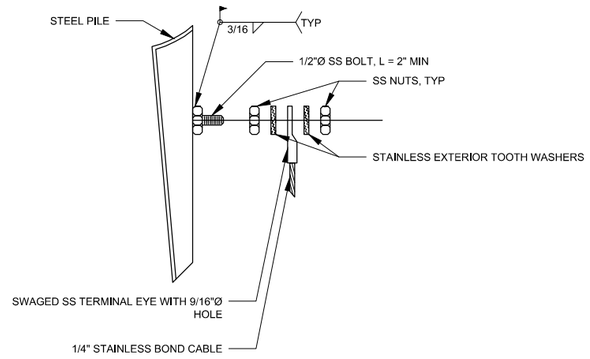


1 ANODE BRACELET DETAIL

1" = 1'-0"

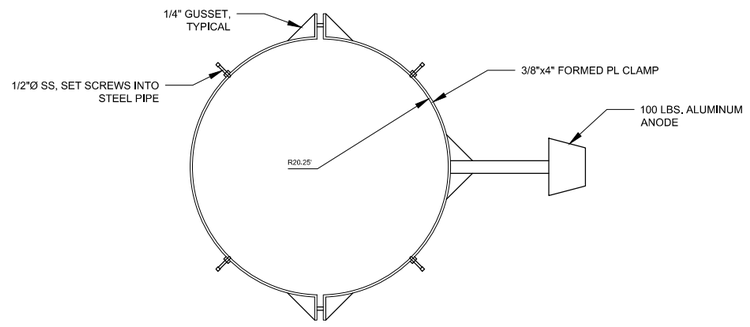
0 1/2' 1' 2'



2 BOND LUG CONNECTION

1 1/2" = 1'-0"

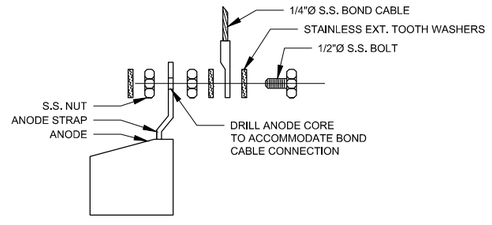
0' 6" 1' 1 1/2'



A SECTION

1" = 1'-0"

0 1/2' 1' 2'



3 ANODE & CABLE CONNECTION

1 1/2" = 1'-0"

0' 6" 1' 1 1/2'

GENERAL NOTES:

1. ANODE CONNECTION DETAILS MAY VARY FROM THOSE INDICATED. SUBMIT ALTERNATE DETAILS TO THE ENGINEER FOR APPROVAL.
2. STANDARD SWAGGED FITTINGS FOR BOND CABLES MAY BE REPLACED WITH 1/4"Ø SS PLATE WITH 9/16"Ø HOLE FOR DIRECT CONNECTION TO 1/2"Ø BOND LUGS ON PILES (CAD-WELD 1/4"Ø SS CABLE DIRECTLY TO PLATE IN LIEU OF SWAGGED FITTING AND 1/2"Ø BOLTS).
3. ANODE MATERIALS SHALL BE ALUMINUM ALLOY CONFORMING TO THE FOLLOWING MINIMUM REQUIREMENTS:
   CURRENT CAPACITY = 1100 AMP HOURS/LB
   EFFICIENCY = 85%
   MIN VOLTAGE POTENTIAL = 1.1 VOLTS (CU/CU REFERENCE ELECTRODE IN SEAWATER),
4. DIMENSIONS OF ANODES SHALL BE DETERMINED BY THE MANUFACTURER.
5. UNLESS OTHERWISE NOTED, OF BOND CABLES, BOND LUGS, FASTENER PLATES AND CONNECTION HARDWARE SHALL BE STAINLESS STEEL. TYPE 316. SS BOND WIRE SHALL BE STRANDED AND CONFORM TO ASTM A368.
6. REPAIR OF FIELD WELDS AND DAMAGED COATING IN ACCORDANCE WITH SECTION 504 OF THE CONTRACT SPECIFICATIONS.
7. INSTALL TOP OF EACH ANODE 1-FOOT BELOW MLW.
8. BOND LUG CONNECTION (DETAIL 2) SHALL BE MADE 1-FOOT BELOW BOTTOM OF PILE CAP AND ABOVE HWL.

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CATHODIC PROTECTION DETAILS

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CP-102

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